Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

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THE
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Rail Road News.

Travelling Damages.

Last week at the Circuit Court, Albany, N. Y., Mrs. Tarbell obtained a verdict of $1000 against the Albany and Troy McAdam Turnpike Co. for an accident resulting in the death of her husband. Owing to a heavy embankment of snow and ice, running across the road, the stage in which her husband was a passenger was overset. At the same Court James Collins obtained a verdict of $11,000 against the Mohawk and Hudson R. R. Company, for injuries received in collusion of two trains of cars, in one of which he was a passenger.—His foot was crushed and he was made a cripple for life.

Albany and Rutland Railroad.

A meeting was held at Albany last week, to consider the subject of a railroad from Albany, through Waterford, Bennington, Vt., and then through Manchester to Rutland, to intersect the Boston and Burlington Railroad. A committee was appointed, consisting of Messrs. Corning, Olcott, Kidd, Edwards and Temple, to apply to the Legislature for an extension of the line of the Cohoes railroad to the Vermont line, near Bennington.

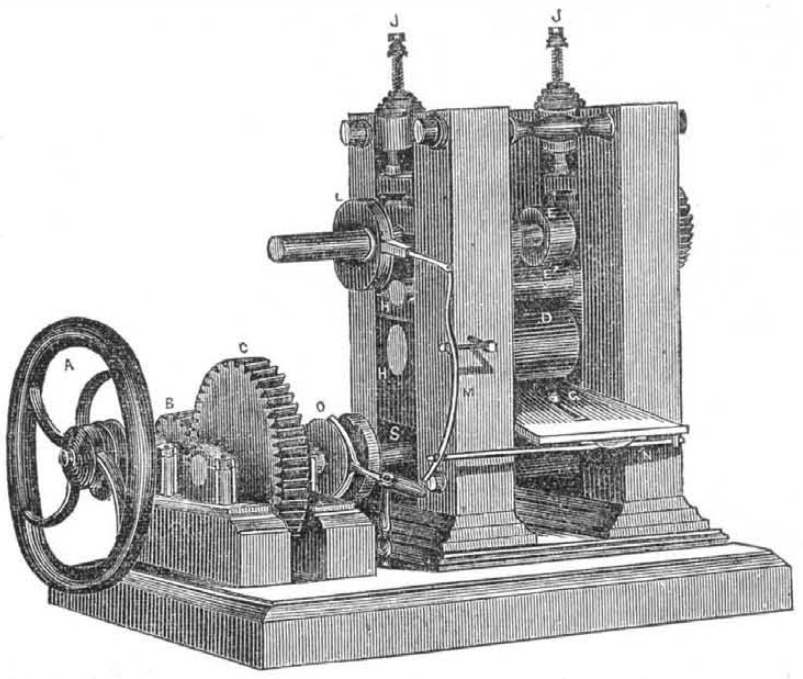
Plank Roads.

A. A. Dexter, C. E., of Cross Keys, Ala., has surveyed a route for a plank road from Talladega Valley to the cities of Montgomery and Wetumpka, to unite the interior with navigable waters. He has presented an able Report to the Corporate authorities of Montgomery and Wetumpka, for which we are indebted to him for a copy. The extreme distance of the route is 176 miles from Gunter's Landing on the Tennessee river, to Montgomery. The country is mountainous in many places, and many difficulties are in the way of its construction, and the total cost is estimated at $176,327 65.

From the nature of the country, we think with Mr. Dexter, that a road 10 feet wide would be the best. We believe that plank roads would be of immense benefit to the Southern States, as pine is plenty in the most of them, and beside there is an abundance of other useful materials for the cheap construction of such roads. We believe that they will be the means of completely reforming the interior or rural transit trade of our country; and in the South, where we have such a vast extent of country, no portion of the United States would be so much benefitted by them as the said States. We are glad to see the spirit exhibited by some of the Southern States, and the Report of Mr. Dexter is calculated, from its candor, to do much good in this respect. Texas should give the subject of plank roads a candid consideration—no State requires them so much.

A great sea-serpent has been seen by Capt. Blankensip, of the Wm. Seabrook, steamboat, on a recent trip between Charlestown and Savannah. Wonderful! Its head was long—very. Its back was high, very—all wonderful.

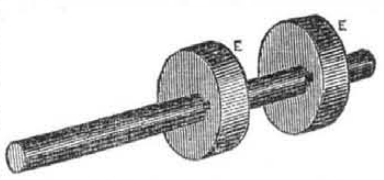
IMPROVED MACHINERY FOR ROLLING IRREGULAR FORMS OF METAL.---Fig 1.



This improvement in machinery is the invention of Mr. John S. Hall, of Columbus, Ohio, and is secured to him by patent, recently granted. The nature of it consists in connecting with the rollers of an ordinary rolling mill, a shaft above, with cam rollers thereon, to act upon the roller or rollers below, one or two of which rise up and down in their bearings, rising and falling while revolving, to draw metal bars to any pattern, and of any size, according to the pattern of the cam, and the speed of the rollers and cam shaft, which can be varied by gearing, to make a small cam roll a long bar, and *vice versa*. It is therefore a compact and variable machine.

Figure 1 is a perspective view. Figure 2 is a view of the cam or pattern rollers on their shaft. Fig. 3 is a view of gearing to change, for the purpose of drawing bars of different lengths, with the same pattern cam. Either one, two or more cam patterns may be employed on the same shaft. The same letters refer to like parts on the figures. The machi-

Fig. 2.



nery to the left, in Fig. 1, represents the feeding motion. The rolling machinery is constructed like those of the ordinary rolling mill, only the roller standards are higher for the cam shaft. A represents the master wheel, to drive the machinery; B an intermediate, C, gears into it to drive the main lower roller shaft; and O is a common clutch, to set the rollers in motion, and stop them in the usual way; D is the second roller, rolling on the top of the under one (not seen) on the shaft, S. The skelps or bars to be rolled into the required shape, are fed in between the two under rollers; G is the feed table. A small back or butt is shown, which can be set for bars of various lengths, by moving it in the slot shown in the middle of the said table. The bars to be rolled are laid on the table inside, against this butt, E E are the cnm or pattern rollers, and E 1 is a small intermediate roller. The rollers D and E 1 have their bearings in boxes, which move up and down in the slots in the standards. The cam rollers, E, therefore, act as they revolve upon the roller E 1, to exert the greatest pressure, according to the form of the cam, at those points required, to roll the hot bar passing between the two under rollers, to the required pattern. If the two rollers E 1 and D, were not allowed to move up and down, no such effect could be produced. The roller, E 1, is not always necessary—the machine works without it, for short bars, but for a change of speed, for long bars, it is best to use it. Figure 3, by the gear wheels, S R P, shows how the speed may be changed, by considering the dotted lines, a smaller cog for short *bars*, to give the cam rollers a greater or less speed. J J are screws for setting the cam rollers in their proper position, according to the gearing. It can roll strap hinges, plane irons, eliptic springs, socket chisels, axletrees, shovels, axes, spades, &c., and can be applied to any common rolling mill. The feed motion is a separate patent of Mr. Hall, but combined with this machinery it forms a most perfect

Fig. 3.

machine. Every mechanic knows that a reciprocating motion can be converted into a rotary motion by an eccentric or crank, and *vice versa*. L is the eccentric, secured on the cam shaft. This eccentric is connected with the table, G, by the complex lever, M N, which gives a reciprocating, or out and in motion, to the said table. This feed motion, by the eccentric, like a cut-off, can be set to give the table a long or short sweep, for long or short bars, and to feed them in exactly, according to the pattern of the cam. The table, G, therefore, like that of an iron planing machine, slides out and in.

One of these machines is now in operation in Columbus, Ohio, at the establishment of Hall, Case & Co., and one will soon be in operation in this city.

The claim of the Patentee is for elevating and depressing one of the rollers of a rolling mill, in such a way, that a pattern of any length on the cam, may be made to affect the surface of any given length.

Mr. C. H. Clark is Agent for this patent for the Eastern States, and communications respecting it, may be addressed (*p. p.*) to S. C. Hills. (See his address on advertising page.) This invention, we would state, has received the highest commendations from gentlemen well qualified to judge of its merits.

Useful Receipts.

To Color Pine to Imitate Black Walnut.

The pine should be perfectly free from knots, (as they will not color,) and a strong solution of hot logwood, rubbed carefully all over the pine, and then it is allowed to dry. Another coat may be given, or a number, according to the shade wanted. After the logwood is dried, a solution of copperas should be applied in the same way as the logwood, which will make the color quite black.

It would be better to have a large vessel of strong logwood liquor, in which to steep the pine for a few days, such as an old molasses cask; after which the copperas should be applied as before stated, with a spunge. The copperas is dissolved with warm water. The logwood must be boiled for three hours in a vessel. It requires to be very strong, but there is no rule that we know of for the quantity; any body, by the directions given, cannot fail in striking the mark. Ramrods for guns are dyed in this way, canes, &c. It is applied to all light colored woods, as well as pine. If copperas cannot be got handy, a few scraps of iron steeped in vinegar for a few days, will answer just as well.

By using a strong solution of sumac in place of the logwood, the wood will become quite dark when it gets the copperas put on it, but it will not have the rich appearance of the logwood color. By using alum in place of the copperas, a purple kind of color will be made on the wood.

Every kind of wood is easier colored than pine, because there is so much resin in it which prevents the dye from entering. It is therefore necessary to have the wood free from knots, and to apply the logwood very hot.

How to Preserve Health.

Medicine will never remedy bad habits. It is utterly futile to think of living in gluttony, intemperance and every excess, and keeping the body in health by medicine. Indulgence of the appetite, indiscriminate dosing and drugging, have ruined the health and destroyed the lives of more persons than famine or pestilence. If your will take advice, you will become regular in your habits, eat, and drink only wholesome things, sleep on a mattress, and retire and rise very regularly. Make a free use of water to purify the skin, and when sick take counsel of the best physician you know, and follow nature.

Ease to People who are Troubled with Asthma.

An individual who has suffered much from asthma, and who has in vain sought relief from regular physicians, wishes us to give publicity to the following remedy:—

"Procure common blotting paper, and thoroughly saturate it in a solution of nitre, (saltpetre,) and let it be carefully dried by the fire, or by exposure to the rays of the sun. On retiring at night, ignite it, and deposit it, burning, on a plate or square of sheet zinc or iron in your bedroom."

The solution of the chloride of zinc is an effectual remedy against bed bugs. It is applied with a brush, and is the discovery of Sir Wm. Burnett.

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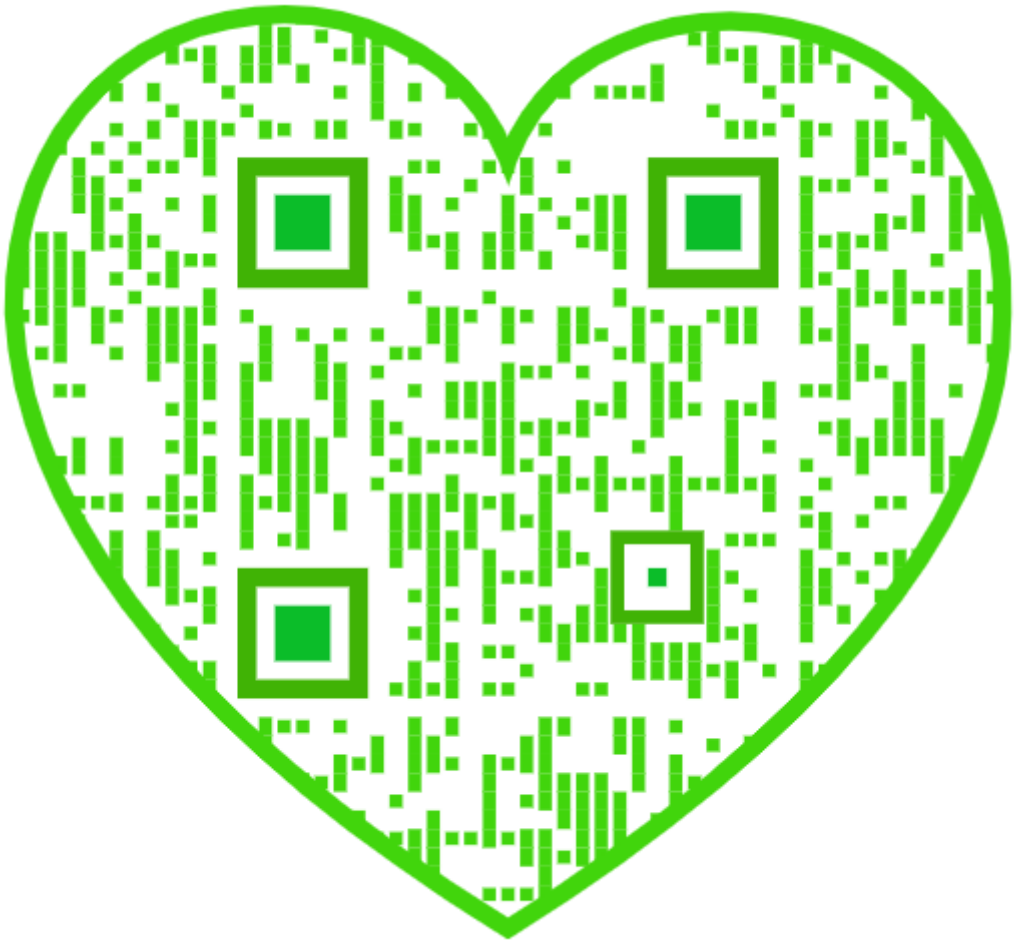

Miscellaneous.

Correspondence of the Scientific American.

WASHINGTON CITY, March 19, 1850.

I find that a strong effort is making in opposition to Mr. Ewbank's confirmation as Commissioner of Patents. It is said that the chief movers in the business are the members of the Convention of Inventors who assembled in Baltimore last year. But the Commissioner has many powerful friends, and in the absence of any charges of any official neglect, I do not think he will be defeated. It is an unthankful position, and one in which the officer in the discharge of his duty must, inevitably, make many enemies among unreasonable men.

You will perceive that Congress has at last ordered the printing of the Patent Office Report for last year, viz., 100,000 of the agricultural portion and 50,000 of the mechanical. When the printers will have it ready is another question. In the course of the debate it was stated that four-fifths of the population of the U. S. are agriculturalists.

Yesterday the workmen removed the shed over the unfinished work of the east wing of the Patent Office building, and the stone cutters are busily engaged in setting the beautiful blocks of white marble. The contractors, Messrs. Provost & Winter, say they intend to carry up the east wing by autumn. It is really a pity for the industrious laborers to work along from month to month, for only "promises to pay," which are cruelly shaved by the brokers.

I have just seen some specimens of white ash coal, recently discovered at Mill Creek, Pa. The vein is immense, being apparently 93 feet solid.

Many of the California emigrants from this section are taking out with them quicksilver machines; they expect to make immense fortunes by them.

Mr. Clay has been presented by a gentleman from Virginia with a cane made of a piece of gum copal tree, from Madagascar. The head is formed of the tooth of a sperm whale.

I am told that the more important Smithsonian Lectures will shortly be published and disseminated at the actual cost.

A letter from Cincinnati says that a Mr. Sellers, of that city, has just completed an invention which will simplify and revolutionize the whole science of engineering. It is said that the machine combines the operation of the perambulator with that of the pentagraph, giving profile lines of plats, surveys and measuring distances.

A petition, signed by over 200 firms, corporations and individuals, is about to be presented to Congress, asking such an amendment of the Patent Laws, so that any party, feeling agrieved by the issue of letters patent, may, by a suit at law, or a bill in Chancery, have the question of their validity determined legally; also that some check shall be interposed or some safeguard provided, against the erroneous or injudicious re-issue of letters patent by the Commissioner. They particularly complain of a patent which, they say, was unjustly granted to Charles Goodyear for vulcanizing india rubber.

The amount of business done on the Washington and Baltimore R. R., during the past 6 months, amounted to nearly $24,000.

The battle relative to the Woodworth Patent, waxes warm, and it is very evident that some people think that votes can be purchased by splendid suppers. *

Remonstrance Against the Washington Monument.

Arthur Gilman, and forty more "artists" of Boston, have remonstrated by an appeal to the Legislature against any contribution by Massachusetts to the Washington Monument, on the score that the design of the structure is in bad taste. This is a mean business, showing nothing of a great and liberal spirit, which always characterizes true genius. To criticize the design of the structure is something which every artist has a right to do as a matter of opinion,—to petition politically against contributing a stone to it, exhibits an envious feeling.

The Flax Culture and Linen Trade of Ireland.

It was a singular but true expression of Daniel O'Connell, that "the rivers of Ireland are filled with the finest of fish, but the banks are lined with a starving people." Many enquiries have been made, and many books written to investigate the cause of Ireland's miseries, but the most contradictory reports have been furnished respecting the causes, but not one respecting the effects. Miserable though Ireland is in the aggregate, yet she is not all wounded and full of sores. In the Province of Ulster, there is general comfort, prosperity, intelligence and increasing wealth. While Dublin has declined, Belfast has progressed, and is rapidly progressing. The cause of this has, with apparent truth, been attributed to her population, which is composed of descendants and natives of the adjoining Island. Nearly the whole linen trade of Ireland may be said to be managed by the manufacturers of Glasgow, Scotland, who are as much natives of Ulster as of Scotland. The linen trade of Ulster, the northern Province, occupies the highest place, is of vast extent, and rapidly increasing.

The export of linens and linen yarns from Ireland to England, and all parts of the world, reaches £4,000,000 annually, and in every market is this produce of Irish industry to be found. At the present day, about 300,000 souls derive a means of livelihood, directly or indirectly, from the linen manufacture. The progress of mechanical skill has effected a great revolution in this branch of industry. Twenty-five years ago, it was still essentially a rural manufacture. The small farmer grew the material, his wife and daughters spun it into yarn, and with the aid of his sons, he wove it into cloth, which was sold in the nearest market to the bleacher, who undertook the after-preparation until it was produced in a state fit for sale. But the application of machinery to the process of spinning changed all this. There are many persons who sigh after the days when the busy whirring of the wheel was heard throughout the winter nights and the long summer evenings, in the inland valleys of Ulster. But, however interesting such a rural manufacture may have been, however valuable as a source of employment around the cottage hearth, and however preferable, in a moral and sanitary point of view, to the employment of hundreds of young persons within the walls of a factory, stern necessity compelled the adoption of this improvement. Had Ireland then tried, as Germany and Belgium have since endeavored, to retain the hand spinning, and to neglect the advantages offered by the newly discovered powers of machinery, she would undoubtedly have lost, as other countries have, a great proportion of her linen trade. About 1828 the first flax-spinning factory was erected. This trade now counts 52 mills, and numbers 312,000 spindles. In twenty years it has attained present magnitude. It employs about 18,000 individuals, and distributes among them, in wages £300,000 annually. In the buildings and machinery £1,500,000 are invested, and 18,000 tons of flax, value three quarters of a million sterling, chiefly of the growth of Ireland, are annually consumed. About 150,000 tons of coal are yearly required to drive the steam engines of the flax-mills and bleach works, employing 40 or 50 vessels, and 200 to 300 seamen, to transport them from the collieries of the sister island.

The increase in Irish manufactories, has been 53 per cent., a wonderful increase, truly. The cultivation of flax gives ample employment to the surrounding population, old and young, from the day the plough is put in the ground to prepare it for the seed, until the loom turns out the finest cambric and linen.

Gen. Bayly of Va. has introduced a bill from the Ways and Means, to supply what is called 'deficiencies in the appropriations' for the year ending in June next, in which the following item:

"Toward the erection of the wings of the Patent Office building, according to the original plan, under the direction of the Secretary of the State, Ninety Thousand Dollars, to be paid out of the Patent Fund."

Printing of the Patent Office Report.

On the 12th inst. the House of Rrepresentatives resumed the consideration of the motion to reconsider the vote, by which the House laid on the table Report of the Committee on Printing, to print one hundred thousand copies of the Report of the Commissioners of Patents.

Mr. Venable opposed book-making by Congress as wrong from beginning to end. It was not the purpose for which Members were sent here.

Mr. John A. King was in favor of publishing a larger edition than ever of the report.—Much has been done for commerce and manufactures, but little or nothing for the great farming interests.

Mr. Sawtelle of Me. said that four-fifths of the population of the country are agriculturists. Heretofore, nearly all printing done has been for the commercial and manufacturing interests, and it was no more than right that the largest number of the Report be printed for the farmers.

Mr. Woodward of S. C. denied that this was a Report. It was an abstract treatise on abstract science and philosophy. He wished the commissioner to send the right kind of a Report—something practical and not speculative.

Mr. Casey of Penn. contended that it was nothing more than just that the farmers, who have so long been neglected, should have something done for them. He moved the Previous Question.

Under its operation, the vote rejecting the resolution was reconsidered.

Mr. Evans of Md. denounced the whole system of public printing, and said that the report of the Patent Office were almost entirely destitute of interest.

Mr. Wentworth, Ill. moved to print 50,000 copies of the mechanical portion of the report, and 100,000 of the Agricultural portion.

This was agreed to, and the resolution was passed.

[We hope that our Agricultural Department will be established separate from the Patent Department. Our farmers, manufacturers, nor our people are taxed to support the Patent Office, but our inventors; although many of our M. C.'s, we suppose, don't know it. Why don't they vote a decent sum for agricultural purposes? This would be the way to show that they had our farmers' interest at heart, let them speak in deeds.

A Shirt for Poor Prince Albert.

We copy the following news from the St. Louis Republican:

"We examined yesterday some beautiful specimens of needlework, which have just been finished in this city, and are intended as a present for Prince Albert and his youngest son, of England. There were two shirts—one designed for the father, the other for the son—made of the finest linen which could be obtained, and the needlework exquisitely wrought. Some idea may be formed of the labor bestowed upon these articles, when it is stated, that there are 152,217 stitches upon the large, and 95,154 stitches on the small garment. We think it will be hard to find similar specimens of needlework in Prince Albert's dominions.—They were made by Mrs. Mary E. Hicks, formerly of Connecticut, and Miss Elizabeth Hawkins, late of Toronto, Canada, but both now of St. Louis—the latter doing all the hemming. They are to be sent to the British Minister at Washington, by whom it is expected that they will be transmitted to the Prince."

[These shirts fulfil the old proverb, "a fat hog is always well greased." We don't like the giving of presents to those big folk that don't need them, but they are the very persons who are always lucky to get such things.

The Honey Guide.

This singular bird is a native of Southern Africa, toward the country of the Caffres. It is a small, with a gray-brown back, and white beneath. It feeds principally on bees and honey, and is said to procure the aid of man to obtain honey, in the following manner:

"The morning and evening are the times of feeding; the note of the bird, well known to African hunters, is then shrill; the latter answer the note from time to time, till the bird is in sight; it then flies forward by short flits, towards the spot where the hive is situated, and thus secures a portion of the spoil from its grateful allies." The natives hold these birds in great reverence, and highly resent the killing of them. In order to fortify them against the stings of bees, nature has furnished them with skins so thick that they can with difficulty be pierced with a pin.

Capt. Forbes' New Ship Rig.

We have occasionally, says the Boston Post, spoken heretofore in terms of commendation of this rig. It was adopted by the owners of two ships during the last season—the "Reindeer" and the "Lanto." Letters were received here lately from Capt. Lord of the former ship, to the owners, in which he says:

"Her rig I was rather prejudiced against, but I must confess, the more I get acquainted with it the better I like it. I am confident that in a sudden squall, or change of wind, that sail could be got in much more expeditiously than it could with the old rig, and the ship always kept under safe canvass; for as soon as topgallant sails or upper topsails are furled, she is in fact under double reefed topsails, and prepared for any kind of weather, however severe. Again if a ship should be running, and make the land unexpectedly, and it is necessary to take in sail and hand off, while with the old rig all hands would be employed in taking in topgallant sails, and getting topsails down for reefing, with the new rig the topgallant or upper sails would be furled, and the ship stand off in fact under double reefed topsails."

These advantages of the new over the old rig we think must soon be made apparent to all persons who desire to have their ships worked in the best way, and with the greatest economy of labor; and the time, therefore in our opinion, cannot be far distant when it will be adopted by all owners of first class ships.—Another very important reason for its adoption is the comfort of the crews; for when sail is to be shortened in the new rig, the watch on deck can take in the upper topsails, and your ship is immediately brought to what in the old rig would be double reefed topsails, whereas under the old, or present rig, it requires all hands to be called to double reef the topsails, which in European winter voyages is a matter of every day occurrence, and in severe and stormy passages wears out a crew more than all other duties combined.

Oris and Charcoal Paste.

From experience we can truly say that no dentrifice yet offered to the public equals this in point of intrinsic merit. The combination of two such agents as Oris Root and charcoal, without the introduction of acids, forms an unobjectionable compound, especially to those who are acquainted with their properties, charcoal being a disenfectant and neutralizing agent, it tends successfully to remove fœted smells etc., the successful manner in which the two articles are compounded, constitutes one of its most important features.

Prepared by Dr. L. C. Dale, Boston; he is now stopping at Earles' Hotel in this city.

Libel Suit about the Hague Street Explosion.

In the testimony before the Coroner's Jury, the inventor of the Boiler, Mr. Montgomery, stated that Muligan & Co., did not build the boiler according to instructions. This statement was contradicted by Mr. Mulligan, in a card published in the Sun, which displeased Mr. Montgomery, who instituted a suit of libel. After a delay of a few weeks, the case has been dismissed by the Court, the complainant not appearing (twice) to support the charge.

The Double Eagle.

This beautiful new coinage has been issued from the mint, and far exceeds all the other golden pieces in elegance as in value. The device of the head is from the antique, and is an emblem of Liberty, as required by law. The reverse is designed in conformity with the act of 1782, which describes the arms of the United States with the scroll containing the motto "E Pluribus Unum," more extended and ornamented than usual, and seeming by its form and arrangement to indicate the name of the piece.

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For the Scientific American.

Steam.

After a careful examination of the Report made by the Commissioner of Patents to the Senate, during the last Session of Congress, on the subject of Steam and Steamboat Explosions (Dec. 18), we are further confirmed in the opinion heretofore entertained, that the direct cause of almost all of the dreadful explosions that have occurred, are to be traced to *Unsaturated Steam.* We would here, at the outset, wish to observe that we have not the vanity to think that we are any *wiser*, or possess any more knowledge on this subject than our neighbors. On the contrary we know we have much to learn of the properties and power of this useful but fearful agent. And it is only with the view of again calling the attention of scientific and practical men to this subject that these articles are written. We merely give them as our own views, if we are mistaken we would gladly be set right. In a series of experiments made by the Franklin Institute, under the auspices of the Patent Office, page 81 of the document referred to above, it is said, "The different causes of explosions are discussed by the committee under five heads, which we shall notice in the order adopted by them :—

First, Explosions from undue pressure within the boiler, the pressure being gradually increased."

That this cause will produce explosions we have never heard denied. It is universally admitted that saturated steam always gradually increases in elasticity or power; and in order to produce an explosion, the engineer must also increase his weight upon the safety valve, if not already overloaded, "or it must adhere from rust, or some accidental cause." Here the committee confirm what all claim to be true, that a boiler made of sound materials will not explode under a gradual increase of steam, unlesss the safety valve is tampered with or will not work. If the boiler would bear 200 lbs. pressure, and the safety valve loaded to 150 lbs., it would, if in order and untouched, continue to *blow off*, until steam reach 201 lbs., when the boiler would explode. We doubt if ever an engineer has committed accidental suicide in this way—gradually blown himself up.

"The second cause of explosions is produced by the presence of unusually heated metal within a steam boiler. If parts of a steam boiler became highly heated, say to redness, danger results from two causes. The tenacity of the metal is diminished, and the heat which it contains, if transferred to water, will suddenly produce an increase of elasticity in the steam."

It is evident that in order to produce this state of affairs, the iron must be naked, or in other words, water could not be in contact with it, consequently the heat must be directly operating upon the steam within the boiler; if this is the case, then the question arises,—is there any difference between the heat of the iron and the steam that is in direct contaet with it? If equal, what would be the elastic power of steam heated to the same degree that it requires to bring iron to a red heat? 750°, (Haswell); the same authority gives to 510° of heat an expansive force to steam of 50 atmospheres, or 750 lbs. per square inch. Now what, we ask, prevents an explosion until the iron reaches the point of "diminished tenacity." Is not this explained on page 85, as follows: "steam was formed within a boiler and then a fire of charcoal applied around the top and sides, so as to communicate heat directly to the steam until it becomes highly surcharged (or unsaturated); in one experiment of nine, given in the table of results, the steam had a temperature of 533° Fahr., and a pressure of only 6.8 atmospheres while if it had been of the full density due to this temperature; that is, had it been saturated steam, it would have had an elastic power of more than sixty atmospheres; water was thrown into this hot and unsaturated steam, under different circumstances. In no case an increase, and generally a decrease of pressure was found to result from the introduction of the water."

These facts we do not doubt; we have heard of just such experiments having been made with *full grown* boilers, of their having been worked until they became perfectly dry, and no explosion ensued. Why? Because water and saturated steam was not present. For we contend, it just as much requires water, saturated and unsaturated steam to produce the instantaneous explosive power, as it does nitre, sulphur and charcoal to form gunpowder. We must, with all due deference, say the experiment was a failure, and was hastily passed over without meeting with the attention it deserved. It was evident to the gentlemen composing the committee, that steam, when highly charged with heat, loses its elasticity or expansive power, and the differences were so great, that it is indeed surprising it should have been so slightly noted. At 533° it had a pressure of only 6.8 atmospheres, or less than 100 lbs. : whereas, had it have been saturated, it would have had a pressure of 900 lbs. per square inch, or 60 atmospheres.

There is still one fact stated by the committee to which we would refer. They say the fact of the foaming of water, when heated and suddenly relieved from pressure, was clearly established that its "extent was shown to be such as to produce false indications in the guage cocks." With these facts, as developed by the experiments made by the committee, and shall we say confirmed by experience, for we know they are correct, we will attempt to show that to the cause before stated, the presence of unsaturated steam, is to be attributed nearly all the explosions that have occurred. In order to give our views as clearly as it is possible for us to do, we will endeavor to give a description of a two boiler engine, such as we use out West. The boilers are generally of one quarter iron, 30 feet in length, and 40 inches diameter, two flues 15 to 16 inches diameter, running clear through both heads. Water is usually carried about three inches over the tops of the flues, and the fire line about one inch above. The openings are first, the chock joints, forward, connecting the boilers with a three inch opening, they are placed half way up the sides of the boilers, and serve as a water connection forward :—next the safety valve usually placed about 8 feet from the forward end of and on top of the boilers, the usual size about 4 inches : next the steam pipes, also placed on top about 10 feet from the aft end ; the openings from the boilers are from 4 to 5 inches, and usually open up into a cross-pipe or steam chamber of from 12 to 15 inches diameter ; from this the main steam pipe springs, carrying steam to the cylinders. At the aft end, and on the secured ring on the bottom, the supply pipes enter the boilers ; they are from $2\frac{1}{2}$ to $3\frac{1}{2}$ inches in diameter; through these various openings the water and steam is continually flowing. Let us imagine that a boat having boilers so constructed, "and we make them all so now-a-days," has just landed, and that water was scant at the time of her doing so ; that the water head sunk below the fire line, a portion of the boiler left naked, and subjected to the direct action of the fire, would this give a gradual increase of pressure to the steam that would be generated, and would it only attain its greatest amount of power? or, in other words, reach the explosive point, just at the time the engines were put in motion, and at no other ?—(Examine the history of all explosions, and you will find—defective materials excepted—they occur at this time, be it long or short.) The safety valve, in perfect order, loaded to 160 lbs., gives no indication of increased pressure, and so long as the engines are kept quiet, every thing remains in "statu quo," but on starting the engines, generally at the 2nd or 3rd revolution, an explosion ensues. How is this ? A "gradual increase of pressure" it cannot be. The materials were sound. How then reasonably account for it ? Why, simply, the heat generated during the detention passes into the steam, it becomes thereby surcharged, or unsaturated, continues to increase in temperature, but decreases in elasticity. The engines are opened up, and a general agitation is produced within the boilers, from water remaining in them, "foaming up;" from water injected through the supply pipes by the force pumps ; from steam taken to fill the cylinder from the flow of water through the chock joints, and steam through the safety-valve :—all these causes operating at the same moment of time, we believe, produces such a general mixture of all the contents of the boiler, the water and saturated steam combining with the unsaturated, which, although deprived of a portion of its caloric, has its expansive force restored in a far greater ratio, and an explosion is the result. Such, we believe is the "modus operandi," we may be in error, as we do not wish to set ourselves up as Sir Oracle, we only say, "Let us reason together." Giving to the Committee all the praise it richly merits, for its laborious and scientific researches, both on steam and the steam and the strength of materials, still we are compelled to say it surprises us, that when they had satisfied themselves of the fact that steam when directly acted on by heat increases in temperature, but looses in expansion, that they did not carry their investigations further—procure a boiler, attach a small engine and make a thorough examination of this seeming paradox. It may be urged they had no means, and were only carrying on their experiments upon a limited fund furnished by the Patent Office. Admitted, still they might have urged upon the Office: "we are unable to make such experiments as the subject demands without the use of a boiler and engine. We cannot be expected to test the qualities and power of steam with a *tea kettle.* Government is directly interested in this matter, looking as we do to a Steam Navy, and this subject should be fully and fairly investigated. We have clearly demonstrated what the boiler will bear, and now wish to place beyond doubt the strength and properties of the subtle agent within it."

St. Louis, Jan. 26, 1850. B.

[We have received quite a number of communications on this subject lately. As the views presented in them are similar to others which have already appeared in our columns, we cannot publish them.

Re-action Water-Wheels.

MESSRS. EDITORS—An article headed "Useful Information about Water Wheels," signed J. S., in Vol. 5, No. 17, Scientific American, is calculated to mislead many who are desirous of obtaining correct and useful information, concerning re-action water wheels. An article in No. 30, same Vol., signed S. L., has answered a portion of the useful information, and shown the absurdity of J. S.'s calculations.

"Seventeen years ago," J. S., says, "he heard of Mr. Z. Parker, and went to see him and found he had *united* percussion with re-action, and at that time found that a wheel at its periphery could outrun the water that propelled it; and after seventeen years experience does assert, that his wheel at its periphery ran 107 per cent of the velocity of the water that propels it at its maximum; also that his tables are correct."

According to the laws of hydraulics a percussion wheel is one that moves with the water and a re-action wheel moves in contrary direction. If a percussion wheel moves faster than the water that propels it, where and from what source does it derive its power? According to well-known principles, action and re-actien are opposite and are equal. If so, how can they be combined in the same wheel, with one current of water upon the same surface, at the same time, to produce any effect? Still, it is painful to state, these principles and proceedings have not failed to obtain countenance in high quarters. We have a specimen of these wheels in this vicinity, made and put in operation under the superintendance of Mr. Parker's agent, and these wheels show for themselves what they are capable of doing. One of 9 feet head, the issues of the wheel 284 inches in area, and gate corresponding, (as J. S. lays down), will grind not to exceed 8 bushels of wheat per hour. The other, with $4\frac{1}{2}$ feet head, wheel and gate issues 450 inches in area, grinding six bushels of wheat per hour. This is the extent of their power. I shall leave it for others to say how much water is expended per minute, but it will exceed any calculations, J. S. lays down, or the tables he speaks of which "millwrights condemn for not understanding them." These wheels can be seen by calling at the mills on Rock River, Illinois.

Re-action wheels have been patented in various forms; however, all agree in certain properties. The effect produced is by placing the inner surfaces of the buckets in a position inclined to the course of the water; that is, inclined to some oblique angle, and that particular obliquity should be given them, which will produce the most effective force. This obliquity requires the application of certain principles of mathematical science. It is found, however, that the most effective obliquity is not the same for all distances from the centre of the wheel.

All re-action wheel men I have any knowledge of (as none of them have made this a point in their patent,) are ignorant of these principles, and have constructed wheels without regard to them, and consequently are inefficient. Such is the case with all the patent wheels in this country. Some think and say that some peculiar twist or crook in the bucket, or manner of getting the water to the wheel by means of cylinders, scrolls, or some other way, they know not what, greatly increases the specific gravity of the water, and adds power to the wheel, and gives this "additional 7 per cent. to the wheel faster than the water that profits it." Yours, truly,

R. C. M.

Illinois, Feb. 25th, 1850.

Sleep and Insanity.

Dr. Brigham, of New York Asylum for the insane, expresses the opinion, that the most frequent immediate cause of insanity, and one of the most important to guard against, is the want of sleep. "So rarely," he says, "do we see a recent case of insanity, that is not preceded by a want of sleep, that we regard it as almost the sure precursor of mental derangement. Long continued wakefulness," continues Dr. Brigham, "disorders the whole system. The appetite becomes impaired, the secretions diminished or changed, the mind dejected, and soon waking dreams occur and strange phantoms appear, which at first may be transient; but ultimately take possession of the mind, and madness or death ensues. The doctor adds :—

We wish we could impress upon all the vast importance of securing sound and abundant sleep; if so we should feel that we had done an immense good to our fellow beings, not merely in preventing insanity, but other diseases also. We are confident that the orgin of much of the nervousness and impaired health of individuals who are not decidedly sick, is owing to a want of sufficient and quiet rest. To procure this should be the study of every one. "I have always taken care," said the worthy Dr. Holyoke, after he was above a hundred years of age, "to have a free proportion of sleep, which I suppose has contributed to my longevtiy."—We fear that the great praise of early rising has had this bad effect, to make some believe that sleep was but of little consequence.—Though it may be well to arise with the sun, or when it is light, (not before, however,) yet this is of minor importance, in comparison with retiring early to bed.

Dr. Brigham gives the following hints for the procuring of sound sleep :

It is important, in the first place, that the mind should not be disturbed for several hours before retiring to rest.

Second.—Retire early, and neither when very warm or cold; sleep on a hair matress or on a bed not very soft. The bed-room should be large and well ventilated, and the bed should not be placed near the wall or near a window, as such an arrangement often exposes the person to currents of cold air.

Third.—There should be nothing tight about the neck, and the Chinese rule of brushing the teeth before retiring is a good one. Tea and coffee taken late in the evening is apt to disturb the sleep. Strive to banish thoughts, as much as possible on retiring to rest, or take up the most dull subjects. Study during the evening is improper.

It is asserted that a grain of camphor, in pill form, followed by a draught of an ounce and a half of the infusion of hops with five drops of sulphuric ether in it, will procure sleep in the first developements of insanity, when nothing else will. It has been tried and its success acknowledged.

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New Inventions.

Improved Tool for Cutting Bungs, Treenails, &c.

Mr. Benj. Bray, of Salem, Mass., has invented a most excellent tool for cutting out bungs, treenails, dowel-pins, &c., of wood, and which, in an extended form, is well adapted for cutting barrel heads, felloes, &c., out of plank or boards. Three cutters are employed, which can be set at three points of the circle, and can be changed by set screws, in an exceedingly short time, to cut different sized pins or bungs, cutting them straight as a roller, or tapering, as may be required. The cutters are set in a face plate of a circular form, and the slots for altering the cutting guage of them, radiate from the centre of the circle. It can be employed either on a vertical spindle, like a drilling machine, or on a horizontal spindle in a lathe. Measures have been taken to secure a patent.

Improvements of Printing Types.

Mr. J. H. Tobitt, a practical printer, has succeeded in introducing into his establishment, No 9 Spruce st., the use of word types. That is, he causes such words as *the*, *and*, *in*, *to*, and all the most common syllables to be cast on one body. By this method, the printer in stead of picking up three types to form the word *and*, he takes up but one. The idea is not new, though Mr. Tobitt is the first who has brought it to practical use in this city.

It has always appeared to us something feasible, this plan of type setting, especially for a few common monosyllables. Mr. Tobitt deserves credit for the persevering practical application of this plan; it is not a patentable improvement however, as some ignorant people have asserted.

Zinc Sheathing.

A ship in New York is being sheathed with zinc, which is claimed to be as durable as copper, and costs only one-third as much.—Exchange.

[The above may be true in the first part, but experience has proven it to be incorrect in the second. It has been found, however, that brass is more durable than copper, as a sheathing. The celebrated Muntz metal is nothing but brass—the copper predominating over the zinc.

Improved Ship Pump.

Mr. Uel West, of this city, an old and respected inventor, has made a most valuable improvement in ships' pumps, for which he has taken measures to secure a patent. It is to be employed in all the new line of steamers belonging to E. K. Collins, Esq. It is so constructed that the plunger works in a separate chamber from the inlet, and always works below the water line of inlet, so that the packing of the plunger never becomes dry, because it is always in water.

Remmington Bridge.

The Remmington Bridge, now in course of construction at Montgomery, Ala., for the passage of a railroad, is described as of considerable importance in the bridge line. Its strength is due to the fact that the fibres of the stringers are not subject to any transverse strain, the only action upon them being exerted in the direction of the length of the fibre. Each end of one of its stringers is firmly bolted down to an abutment, and any weight being laid upon them between the abutments, causes just the same tension of the fibres as in the case of an attempt to break a walking stick by drawing it apart, while holding the ends.

New Locomotive.

Mr. Kirk, at Cambrige, Mass., has constructed a new locomotive, nearly all made of wrought iron, for the Androscoggin and Kenebec railroad. It weighs 21 tons, its wheels are 5 feet 6 inches in diameter, cylinder 16 inches in diameter and 20 inches in stroke. The tender is capable of containing 1800 gallons of water, and the locomotive is warranted to draw the passenger train at the rate of 50 miles an hour.

Mr. Fessenden, of Boston, has invented a filter to be carried in the pocket.

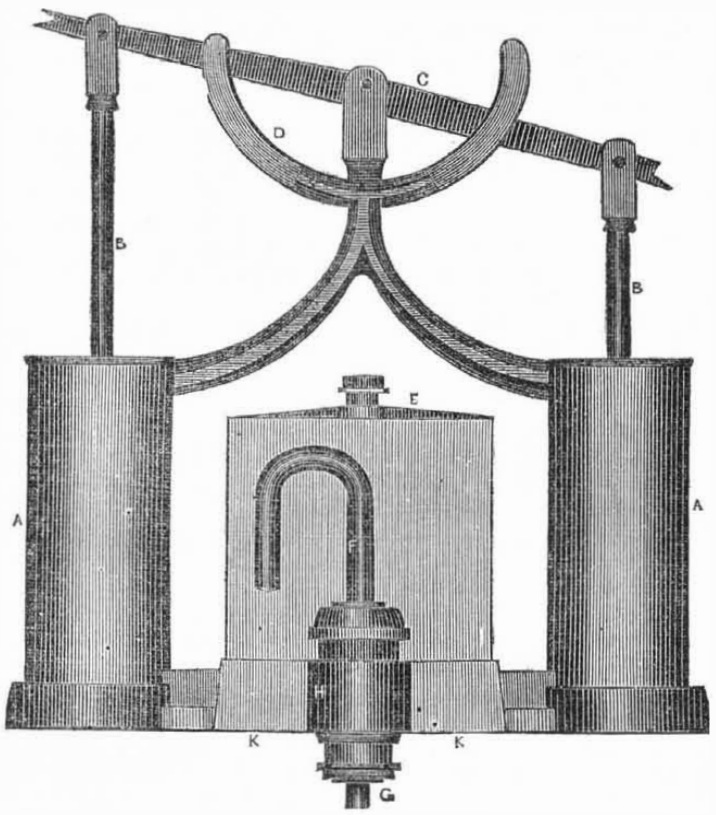
Improvement in Copper Rollers for Calico Printing.

Messrs. J. M. McCormick & Abraham Naylor, of Norton, Bristol Co., Mass., have made an improvement in copper rollers for calico printing, for which they have taken measures to secure a patent. The improvement consists in casting the rollers in such a way that they will not require to be drilled or planed after being cast.

Improved Spoke Shave.

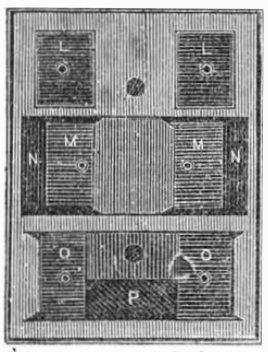
Mr. Inman A. Arnold, of Geneva, N. Y., has invented a valuable improvement on spoke shaves, which has been highly commended by every one who has seen it. The knife is secured in the stock in a different way from what it is in other such tools. A face plate is employed, which can be set to graduate the shaving action of the knife, as desired. He has taken measures to secure a patent.

KASE'S IMPROVED FORCE PUMP.---Fig. 1.



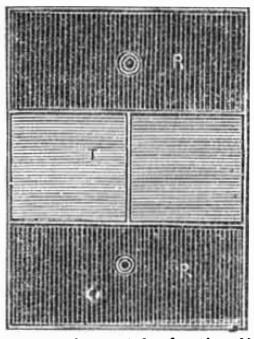
This pump is the invention of Mr. S. P. Kase, of Danville, Pa., and is secured by patent. Figure 1 is a side elevation. Figure 2 is a view of the valves, which are placed on the seat, below the bottom of the air chamber. Figure 3 is an interior view of the bottom of the air chamber, showing the separating plates. There is no valve inside of the cylinders, and the water is drawn in from the suction pipe to each cylinder, and forced out through the ejection pipe by one single passage from and to the cylinder. This is a peculiar feature in this pump. The valves all lie flat, below the air chamber, so that by taking off the air chamber the valves are all exposed to view, and so plain that any man may pack or repair it, which makes it a good thing for farmers. The pistons in the cylinders are very simple; they are made of two discs packed on the outside, with leather, the lower one with its leather turned up, and the upper with its leather turned down, and the faces of the two brought close together, by securing them on the lower end of the rod, B, on the under end of which is a screw and a nut that secures them firmly together. They can thus be packed by any person.

Fig 2.



A A are the cylinders; B B the piston rods; D is a slotted arc guide, in the slot of which the arms, C, play. E is the air chamber. It is perfectly air tight. The nut shown, is the top of a screw bolt, to screw it down air-tight around the valve seats. (There is a slot on each side.) K K is the outside of the valve chamber; it is a box communicating by side passages with the cylinders, and by an opening on the other side, with the suction pipe, G, and the nigh side with the ejection pipe, F. H shows the base of the ejection pipe, at the one ide of the air chamber. The valve chamber is divided into a number of compartments, and there is no communication between the passages of the two cylinders. N N are spaces always open, communicating with the cylinder passages, and P is an open space communicating with the ejection pipe. A piece of leather is laid snugly down and cut for the valves and passages. The compartment under L L is the suction or inlet chamber, and it is covered perfectly tight above with leather packing.—The water rises up in the pipe, G, and lifts the valves, M M, alternately, and passes into the cylinders by the passages, N. When the plungers are forced down, the water lifts the valves, O O, and rushes out by the passage, P, and up the pipe F. The way this is accomplished is by having the lower inside part of the air chamber made with two solid compartments, with a division plate between them. This division plate separates the passages of the two cylinders. R R, fig. 3, is the hollow part of the air chamber, and T is the solid—showing two compartments (with a division plate,) into which the water can enter but not pass back. The water cannot pass down below the valves, M, therefore each of them closes and opens alternately by the lifting and falling of the pistons. The bolt holes are shown, for the bolts, to secure the air chamber. The rivets show the way the lead or iron plates may be secured to the leather, to form a valve. It is very easy to get at the valves of this pump, and very easy to repair them. Those who wish to purchase rights may apply to Mr. Kase The pumps are for sale by S. C. Hills, 43 Fulton street, N. Y.

Fig. 3.



Mr. Brande has shown that Talbottype may be obtained by artificial as well as solar light, by burning phosphorus in oxygen.

Improvement in Looms for Weaving Different Patterns.

Mr. Joseph Reynolds, of Providence, R. I., has invented and received a patent for an improvement in looms for weaving shawls of different patterns, ginghams, also carpets and any kind of pattern goods. The improvement is one which should receive attention especially from those who manufacture fancy checked (tartan) shawls—a kind of fabric which has now become common to every nation in the world, many beautiful samples of which are now manufactured in America, and which are greatly to be improved, as designed by Mr. Reynolds. The patent of Mr. Reynolds states that "the object and advantage of his improvement over all other plans in use, for changing the shuttle, is, that his plan has full control of a series of shuttle boxes applied, either to one or both ends of the lay, as may be required, and that *pattern* plates are used to be set to any pattern which may be designed in stripes, or if connected with a Jacquard, the improvement can be most judiciously employed, to the weaving of carpets with any kind of figures made of different colors of the weft." The pattern plates are set according to the design of the pattern to be woven, and by their combination with levers and bell cranks to the shuttle boxes, each shuttle is moved, or kept in its proper place, to be moved when required to work out the design of a four, five or more different colors in different shuttles. For example, if five shuttles are used, and the middle one is red weft, while the two others on each side may be blue, green, orange and purple, the shuttles can be changed, as set by the pattern plates, to take up the red shuttle or any other one, of the five, either the middle one, or passing over from end to end of the whole set. The shuttles can also be set to vary in their operation from a few inches to yards, such as wearing the border of a shawl with a few picks of one, and more of another color, making stripes in the weft, then the loom will weave the whole middle of the shawl, without a change of weft, to have it all one color, after which the shuttles come into play to work out the opposite border. To work out patterns of this kind, a long, troublesome and expensive pattern chain is employed, in looms at present in use; this is obviated by the pattern plates of Mr. Reynolds, which occupy but a small space in a snug box. An operative can attend two looms owing to the loom not requiring to be stopped to change any shuttle. We have seen a sample of goods woven by this loom—a shawl of a good fabric and well woven. A loom is in operation in Providence, where it may be seen by calling at No. 51 Broadway, that city.

The Patent Battle Ground.

On the 11th inst., the motion of Parker vs. Brant and twenty-one others, for injunction to restrain the defendants from using re-actionary water-wheels, as noticed in the Sci. Am. of last week, was denied. The Judges (Grier and Kane) gave their opinion that the bill of Parker did not set forth that he has such possession of the invention described and claimed by him, as to support his application for an interlocutary injunction.

Gun Stock Patent.

Thomas Blanchard vs Issac B Eldridge.—This was a motion for an attachment to restrain the defendant from using a turning machine, alleged to be an infringement of plaintiff's patent. The following decision was given:—

And now, March 14, 1850, the report of the Commissioner being read, finding that the machine of the defendant is not a continuance of that already enjoined in the case, or a colorable evasion of the injuction issued by this Court, the motion for the attachment is refused, without prejudice to the rights of the parties, or to any question of infrigement of the plaintiff's rights by the defendant's new machine.

The order against Rockafellow, mentioned last week is countermanded.

The American Association for the Advancement of Science met in Charleston last week. President Henry was absent but his place was filled by Prof. Bache.

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Scientific American

NEW YORK, MARCH 23, 1850.

New Article of Food--Meat Biscuit.

Some time since we noticed a new kind of Meat Biscuit, or "Portable Desiccated Soup Bread," invented by Mr. Gail Borden, Jr., a highly respectable citizen of Galveston, Texas. The discovery being fully secured by a patent recently granted, we will give a brief but clear description of it, as it is an invention of the first importance, both to our own country, and it may be said, to the whole human race. The nature of this discovery consists in preserving the concentrated nutritious properties of flesh meat of any kind, combining it with flour and baking it into biscuits. One pound of this bread contains the extract of more than five pounds of the best meat—(containing its usual proportion of bone)—and one ounce of it will make a pint of rich soup. Biscuits by Mr. Borden's process may be made of beef, veal, fowl's flesh, oysters, &c., and thus in a compact form the very essence of agricultural products, fitted for the traveller or mariner, or for the dwellers in distant cities, may be transported by sea or land, from distant rural districts, where flesh meat is comparatively cheap.

In a letter to Dr. Ashbel Smith, Mr. Borden thus relates the way he made this discovery:

"I was endeavoring to make some portable meat glue (the common kind known) for some friends who were going to California; —I had set up a large kettle and evaporating pan, and after two days labour I reduced one hundred and twenty pounds of veal to ten pounds of extract, of a consistence like melted glue and molasses; the weather was warm and rainy, it being the middle of July. I could not dry it either in or out of the house, and unwilling to lose my labour, it occured to me, after various expedients, to mix the article with good flour and bake it. To my great satisfaction, the bread was found to contain all the primary principles of meat, and with a better flavor than simple veal soup, thickened with flour in the ordinary method.

This process of mixing and baking, I found to be easly and quickly done, and to answer the double purpose of concentrating in the same cake, the nutritious properties of animal and vegetable food, so essential to the healthful sustenance of man. This extract of animal flesh may be also combined with corn, or other vegatable meal, and for some marine purposes, I intend to employ the potato and other anti-scorbutic vegetables, having farinaceous qualities, to desiccate the extract"

Dr. Smith, a gentleman of scientific reputation, has communicated a paper on the subject to Prof. Bache, President of the American Association for the Advancement of Science. He says,—"I have several times eaten of the soup made of this meat biscuit," and thus describes the manner of making it:

"The nutritive portions of beef or other meat, immediately on its being slaughtered, are, by long boiling, separated from the bones and fibrous and cartilaginous matters: the water holding the nutritious matters in solution, is evaporated to a considerable degree of spissitude—this is then made into a dough with firm wheaten flour, the dough rolled and cut into a form of biscuits, is then desiccated, or baked in an oven at a moderate heat. The cooking, both of the flour and the animal food, is thus complete. The meat biscuits thus prepared have the appearance and firmness of the nicest crackers or navy bread, being as dry, and breaking or pulverizing as readily as the most carefully made table crackers. It is preserved in the form of biscuit, or reduced to coarse flour or meal. It is best kept in tin cases hermetically soldered up; the exclusion of air is not important, humidity alone is to be guarded against. I have seen some of the buiscut perfectly fresh and sound that have been hanging in sacks since last July in Mr. Borden's kitchen: and it is to be borne in mind, that in this climate articles contract moisture and moulder promptly, unless kept dry by artificial heat.

For making soup of the meat biscuit, a batter is first made of the pulverized biscuit and cold water—this is stirred into boilling water—the boiling is continued some ten or twenty minutes—salt, pepper, and other condiments are added to suit the taste, and the soup is ready for the table. I have eaten the soup several times,—it has the fresh, lively, clean, and throughly done or cooked flavor that used to form the charm of the soups of the Rocher de Cancale. It is perfectly free from that vapid unctuous stale taste which characterizes all prepared soups I have heretofore tried at sea and elsewhere. Those chemical changes in food which, in common language, we denominate cooking, have been perfectly effected in Mr. Borden's biscuit by the long continued boiling at first, and the subsequent baking or roasting. The soup prepared of it is thus ready to be absorbed into the system without loss, and without tedious digestion in the alimentary canal, and is in the highest degree nutritious and invigorating.

The paramount excellence of Mr. B.'s discovery, appears to me to consist in this, that it is a meat biscuit—it is meat and bread.—Human life may be sustained, as we all know, on a diet of a single kind, but the highest degree of corporeal and mental strength and health can long be mainted only by the use of both vegatable and animal food; especially when labors, fatigues and privations are to be undergone. I belive there does not exist in nature or art the same amount of nutriment in as small bulk or weight, and as well adapted to support, efficiently and permanently, mental and physical vigor, as is concentrated in the meat biscuit in question. One ounce of the biscuit meal makes a pint of rich, invigorating animal and farinaceous soup by its combination with water, all the requirements of a good food are answered, animal and vegetable aliment in a sufficient bulky form.

We publish the remarks of Dr. Smith, as explanative of the process of making it, and to show the opinion of a scientific man on the subject. We have also partaken of this soup bread, and consider it to be a most excellent discovery, one invaluable to the geologist, surveyor, traveller and voyager. Two pounds of it will supply one man for a week, and fourteen pounds will support him for a month. It provides the means of making the journey through the wilderness, to the promised land on the borders of the Pacific, comparatively easy.

Foreign Manufactured Articles by American Patented Machines.

Owing to the great delay, of various kinds, of parliamentary business by Congress, it is not easy to arrive at the correct ideas of Committees who have proposed new minor measures, because said measures have barely been noticed, and are therefore, comparatively in the shade. It is stated, however, that a Bill has been *reported* in the Senate, by the Judiciary Committee to amend the Patent Laws, which, we are informed, "provides that the importer, from any foreign country, for sale, of any article manufactured, in whole or partly, abroad, by any process or machine or modification thereof, for which a citizen of the U. S. may then own a patent, shall be held to have infringed such patent and be liable for damages, and the imported article to be forfeited to the American patentee. When a patentee or his agent shall file a bill in equity, complaining of any such importer or vender of imported articles, the judge may order the marshal to seize and hold them, subject to the final order of the Court, and may also restrain their sale, and (without a jury trial) declare such articles to be forfeited to the patentee; the importer's remedy being the costly one of a writ of error."

Having examined the nature of Patent Laws, we know something about them, both the principles upon which they are founded, and the spirit by which they should be carried out. There are some people who have felt the evils of having their patent rights infringed and would endeavor, seriously, but most indiscretely, to amend them as above. A patent is an artificial right. For example, supposing a certain person should invent a machine to-day and secure a patent for it, and suppose another, living three thousand miles distant, should invent the same thing a month afterwards, he could not use his own machine, although he knew nothing about the other man's invention. Now upon the principles of common justice, the second inventor had as good a right to use *his* own invention, as a farmer to enjoy the fruits of his farm. But to encourage improvements in the Arts, the Patent Laws have been made, and they have been the means of doing much good. But as they exist by the *good will* of the *people*, great caution should be exercised, not to entail upon them wrong measures, that would enlist public indignation against them. If the above proposed amendments to the Patent Laws, be adopted, our importers must make themselves acquainted with the process by which every piece of foreign calico is printed, dyed and made. They must know the kind of loom that weaves it, the machine that dresses it, and not only that, but they must know all the processes and machines patented in America. Possessing this great amount of knowledge, they must have mechanical and scientific skill, to judge whether the foreign goods imported, although made by processes and machines, not like in appearance to the home patent, are yet substantially the same—a nice job truly, one that oftentimes puzzles intelligent juries. But an importer, if he has not such knowledge, may, by some ugly fellow, and a willing court, be subject to have his goods forfeited. We are confident that if such a law was passed, it would be the means of doing a great deal of injury and injustice. Let us take an example:—the calico business is very important to *importers*, and suppose that a patent was secured in America for some one color on 1000 pieces of imported calico, the whole of it would be liable to confiscation by the above law.—The same train of reasoning may be applied to any kind of manufacture. A patent for a machine does not cover its products, but the above proposed bill gives it a double power—one not embraced in the principle of a patent itself. If by foreign products, or manufactures, there should be some gross violation of an American patentee's rights, there should be a special law enacted to meet the particular case. If justice requires it, the enactment of such a statute could readily be secured, and it would commend itself upon principle. No general law could be enacted that would not create difficulties of too serious a nature to be lightly esteemed. It has always been, and always will be our object, to advocate full and complete protection to patentees and the owners of patent property, and to do so upon the principles of justice and prudence, so as to carry public opinion with, instead of against inventors and patentees.

The Baltimore Convention of Inventors. Woodworth's Patent &c.

A resolution was adopted in the Convention to repeal the 7th section of the Act of 1839, of the Patent Laws, which reads thus:

"That no person shall be debarred from receiving a patent for any invention or discovery, as provided in the act approved on the 4th day of July, 1836, to which this is additional, by reason of the same having been patented in a foreign country more than six months prior to his application: Provided, That the same shall not have been introduced into public and common use in the United States prior to the application for such patent: And provided, also, That in all cases every such patent shall be limited to the term of fourteen years from the date or publication of such foreign letters patent."

As amended by the Convention it reads thus:—

"Resolved That the 7th section of the act of 1839 should be repealed, and one substituted, which will allow the inventor suitable time to develop and test his invention to free use and sale of the same, not exceeding two years, provided he shall stamp every article so sold or tested with his name, and the date of his invention, and the words patent intended; and no use or purchase by others than the inventor shall be construed to give such other a right of free use, after the expiration of two years from the date so stamped upon the article purchased or used; and any person or corporation who shall sell, construct or use said invention after the two years, shall be held reponsible for all damage from and after that time; provided the same shall be patented by the inventor"

Such an amendment to the Patent Laws would be absurd and injurious. In the first place it grants a re-prospective power—therefore the patent, a mere legal instrument, is made to differ vastly from any other kind of instrument, by exercising jurisdiction over machines that were in existence two years before it was. The old section as it stands, requires no reform—it is perfect, because it is founded upon the great principles of Common Law. It does no injustice to inventors, but good, whereas the reformed resolution would do injury. Who would purchase a two years' privilege of an unpatented invention? Not a single man of common sense. It might also be the means of doing great injustice to the community. There are few who are acquainted, or even make themselves acquainted with the Patent Laws, and many of our mechanics and farmers might purchase tools with "patent intended" on them, when lo! before they would know where they were, round would come some agent, order them to stop their use, or threaten to sue for damages. How strangely would an honest farmer look, after buying an "intended patented" pitchfork to be told the "intended patent" was only *intended* for him to *purchase*, and the patent was *intended* to stop him from using it. What a splendid field such a reform in the Patent Laws, would open up for crafty speculators and cute dealers in *intended patent* wares. When a man invents an improvement, the present law allows him time to test it by a *Caveat*, the only sensible way of so doing. It may be wise to extend the Caveat term from one to two years, but forbid that such a resolution as the above should become law, both for the sake of inventors' honor and the community at large.

The best thing done by the Convention was the proposal to engraft upon the present Patent code, a plan by writ of *scire facias*, to repeal an unjust patent. This single thing, if carried into law, is enough to cover a multitude of sins in other things, but having noticed this before, I need not advert to it at any more length.

By recent news from Washington, Mr. Walden, from the Committee on Patents, reported a bill to extend the patent heretofore granted to William Woodworth for a planing machine. Mr. Otis made a report from the minority of the committee. The Woodworth monopoly, by the bill, is intended to be extended seven years from 1853. How beautiful a thing it is, for those interested in this monopoly, thus to take time by the forelock, but this *time* they will miss it, undoubtedly. The country is aroused to the iniquity of granting special privileges of this description, and petition after petition has rolled in and are rolling in, for a repeal of this special act of Congress, intended for the benefit of a few speculators. The minority report goes against special acts of Congress, *in toto*, for renewals of patents. This is right—one inventor has just as good a right to a special Act as another—there should be no aristocracy in this Republic, but the Lord knows we have enough of it. Let the patent term be extended, rather than have the continual feasting and flattering of men to get special bills of Congress passed every few years, for special individuals. Who can forget the attempt that was made last year to get a bill through Congress, to tax all our honest farmers fifty cents for each of their old cast iron plows. The people are beginning to open their eyes to the evils of one-sided legislation in patent matters. More injustice has been done to inventors and the community by special grants than it is possible to estimate.

The great evils to be remedied are a reform in the contesting of patent cases, at law, and prosecuting just claims in the Patent Office. These things we shall notice hereafter.

JUNIUS REDIVIVUS.

New York.

Notices of Books.

We have some notices of valuable books, which are unavoidably delayed until next week.

Correspondents should write plainly, briefly, clearly, sensibly, modestly and honestly.

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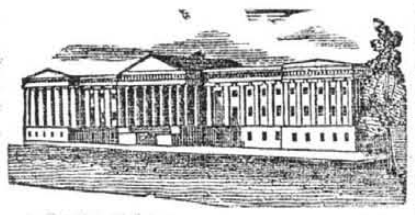

LIST OF PATENTS CLAIMS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending March 16, 1850.

To Wm. B. Barnard, of Bristol, Conn., for improvement in the spiral spring sash stopper.

I claim the combination with the ratchet and click, or any well known equivalent therefor, to arrest the action of the sash elevator, of the spring bolt, for fastening the sash, thereby giving double security against any disturbance of the position of the sash, substantially in the manner and for the purposes herein set forth.

To J. T. Bruen, of New York, N. Y., for improvement in cutting figures in relief on wood.

I wish it to be distinctly understood that I do not confine myself to the precise mechanical devices herein described for holding the material, for moving the carriages to and fro, for setting the cutters, or for holding the rack teeth and blocks, but intend to vary them as circumstance may render expedient.

But what I claim is the combination of an adjustable guide rack with an adjustable guide block to produce the transverse in combination with the longitudinal motion for the purpose of producing on wood or other material forms of a curvilinear, zig-zag or mixed outline, substantially as herein set forth.

I likewise claim the device for effecting the reversal of the shifting lever constructed and arranged substantially as herein set forth, and composed essentially of the adjustable stops, springs, detents, vibrating frame and wheels.

To P. B. Cool, of Columbus, Ohio, for fastening of Terrets in harness-saddles.

I claim the combination of an adjustable pad, and a terret, with each other and with one of the legs of a harness saddle tree, by means of a single joint, so constructed that neither the pad or the terret can be turned on their axis from their proper positions, substantially as herein set forth; to wit, by means of a rectangular opening in each leg of the saddle tree, with lugs, descending from its sides, for the reception of the shank, of a terret, and by the ears, rising from the upper side of a pad, that receive between them the end of the shank of a terret, and by the ears (two) rising from the upper side of a pad, that receive between them the end of the shank of the terret, through holes in which the ears and terret shank, the rivet, passes and hold the three parts securely together.

To James Cunningham, of Reading, Pa., for improvement in ventilating railroad cars.

I claim the employment of jets of air produced substantially in the manner herein set forth, for preventing the entrance of dust into railroad cars or carriages of any description.

To John T. Davy, of Troy, N. Y., for improvement in Furnaces for heating sad-irons.

What I claim is combining with a portable furnace of the usual construction, a surrounding heating chamber, provided with apparatus or slots, to admit of the insertion or removal of the flaps, combined with the door or flap at top, substantially as described.

I also claim providing the said air heating chamber with a revolving top, provided with a single small door or flap, which by the rotation may be brought directly over the slots in succession, and the flaps inserted or removed substantially as described.

To A. O. Dayton, of Washington, D. C., for improvement in coloring photographic pictures.

I claim the application to photographic pictures taken up on paper, or upon any transparent or translucent medium of the mode of coloring, I have described, or any other substantially the same, and which will produce a similar effect.

To N. Dodge, of New York, N. Y., for improvement in pumps for deep wells.

I claim the combination of the pump barrel having a valve as described with the water chamber, at the bottom and the lever at the top substantially as described, so as to raise the water by elevating and depressing the barrel, thereby dispensing with ordinary piston, and piston rod, and avoiding the inconvenience incident thereto.

To Asa Fessenden, of Baldwinsville, Mass., for improvements in machinery for making pill-boxes.

I lay no claim to the particular tools or reducing cutters used in cutting the wood of a stick, but what I do claim is the above described, peculiar arrangement of two or more sets of reducing cutters, applied to another carriage, in a similar manner, feeding apparatus, applied as above set forth, to such cutting apparatus, and two circular saws playing between and acting in concert with the adjacent opposite cutting apparatus of both carriages, the whole operating together substantially as above specified.

I also claim the combination of machinery, by which each of the circular saws, or their puppet heads, or carriages, are alternately moved, first in one direction, and next in the opposite direction, and their supporting ways, the said machinery consisting of the arm, O, or P, affixed to the upright shaft, the side and its projecting pin, applied to the end of the said arm, the grooved cam plate, the lever or arm, connecting rod, the pin projecting from the under side of the carriage, and the springs, (two) the whole being constructed and made to operate, substantially in the manner, and for the purpose as herein before specified.

To Wm. Flong & G. A. Grove, of Chambersburg, Pa., for Cultivating Seed Planter,

What we claim is the combination of the roller, and the harrow for crushing and pulverizing the soil with the cultivator teeth for forming the furrows, and depositing the seed; the roller preceding the harrow, and both preceding the cultivator teeth, as herein set forth.

To Perry Goodhue, of Cincinnati, Ohio, for improvement in air-heating stoves.

I claim inserting the vessel, as described, for throwing down jets of air directly upon the flame and other results of combustion; the cylindrical vessel, being of lesser diameter than the drum, half way up and within which it is placed, so that the flame and results of combination are commingled with the jets of air, and more thoroughly consumed and are also forced to lick the sides of the drum, and thus causes the greatest possible radiation of heat.

And in combination with the foregoing, I claim the pipe, with its enlargement, and the reservoir, as described, for carrying a column of air through a pipe led through the heart of the fire, this pipe enlarged above the level of the top of the fire-bowl, so as to throw jets of air athwart the direction of the downward jets before described, and this pipe being also continued up to a reservoir on the top of the drum, through perforations in the top of which air reservoir, jets of heated air are continually thrown into the domestic or other apartment; by which general construction of this pipe, I effect a commingling, consuming, and outward forcing of the results of combustion against the sides of the drum, and at the same time furnish to the apartment an agent for heating and keeping up an active circulation of the atmosphere in the room to which heat is to be imparted.

To W. Hayden, of Windham, Conn., for improvement in regulators for drawing rollers.

What I claim is the combination of the tube, lever, screw shaft, jointed bar, ocillating shaft, and pinion, gears (three) screw shaft, nut arms, (two) with their left guides, (two) belt, cones, (two) shaft, and level gears, 1, 2, 3, 4, 5, 6, for changing and regulating the speed of the rolls equalizing the drawing or making the sliver the required size, substantially in the manner described in the foregoing specification.

E. Hills, of Cincinnati, Ohio, for improvement in Oil Presses.

I claim first, the construction and arrangement of a series of press cases, substantially as herein set forth, each box forming or carrying the follower of the one next above it, and all being supported when not in action, at suitable distances apart by the offsets on the guides.

Second, the combination of perforated lining plates with the grooves or channels on the interior of the press cases, substantially as herein set forth.

To G. Hotchkiss, gf Windsor, N. Y., for improvement in noddle irons for saw-mills.

What I claim is the combination of the four pointed knuckle with indented straps and screw tie bolts, the whole constructed and arranged substantially in the manner and for the purpose set forth.

To John Johnson, (Assignor to E. Johnson) of Troy, N. Y., for improvements in Looms for weaving piled fabrics.

What I claim is the method of inserting the figuring wire (or wires) into the open shed, and withdrawing the same from under the woven pile or loops by means of a carrier or carriers, to which one end of the figuring wire is attached, when the said carrier is so operated, substantially as herein described, as to receive a motion from and towards the selvage of the fabric, to withdraw and insert the wire, and towards and from the lay to carry the wire to the open shed and when inserted back against the woven part of the fabric, all substantially as herein described.

I also claim combining with each carrier and figuring wire, a guide or support through which the wire passes, substantially as described, when the said guide receives a motion towards and from the lay in unison with the carrier, substantially as described.

I also claim forming each range of figuring loops on two wires introduced from opposite sides and overlapping in the middle with the lapping ends champered or bevelled, substantially as described.

To L. Kingsley, of Norfolk Co., Mass., for improvement in cast-iron car-wheels.

What I claim is the wheel or combination of the arched support plate, the curved spokes or arms, and the curved plate, with the solid or undivided hub, and the chilled rim, all cast together, and in one piece, substantially as above specified.

To L. Kingsley, of Norfolk Co., Mass., for improvement in cast-iron car-wheels.

I am aware that a cast iron wheel with a hollow felloe or made with two concentric rings connected at their sides, and having a space between them, was invented and patented on about the fifteenth day of February A. D. 1838, by one Henry R. Dunham. This wheel however, had a series of straight spokes, and a split or divided hub, the hub being connected to the felloe by such spokes only. I do not claim as my invention, such wheel or any part thereof, although it was able to resist vertical blows or shocks, better than a wheel having a solid or single rim felloe as usually made, it has not the requisite power or strength to resist the lateral strains against the flanch of its tread, nor could it be cast in one piece, and with a solid or undivided hub, and chilled rim.

What I claim as my invention is the wheel made with the chilled rim, a hollow felloe or a support plate, extending around and within the chilled rim, a curved plate uniting the rim and hub, a series of curved arms, and an undivided or unsplit hub, all cast or founded, and combined together in one piece, substantially as above specified.

To S. Knight, of Winchester, Ind., for improvement in the interior arrangement of steam boilers.

What I claim is the troughs surmounting diaphrams (which separate the water space vertically into as many isolated chambers) and having sides which rise higher toward the outside, in order to collect such water as overflows, and to distribute it among the several parts when the boiler recoils.

To T. Lidgerwood, of Brooklyn, N. Y., for improved Lever Lewis.

What I claim is attaching a bent lever, having its foot resting against or hooking, under one of the vertical sides of a stone, to that same vertical side of the stone, by any of the well known forms of lewis, for the purpose as described.

To John Marquart, (Assignor to Henry Schreiner,) of Reading Pa., for improvement in the guage for water casks.

What I claim is the combination of the joints or rods (two) with the piece A C and piece B D, in the manner set forth.

To A. F. Menefee, of Rappahannock Co., Va., for improvement in Flouring Mills.

What I claim is the manner herein stated, in which I have arranged and combined the spouts and tubes, and their slides, with each other, and with the bottom of chest B, and with the boxed conveyors (two), by which complete control is obtained over the quality of the flour passed into the packing chest, and also to give a similar control over the quantity and quality of the flour carried to the flour elevators, substantially as described.

I claim the manner in which I have arranged and combined spouts, pipes, and their slides, with each other and with chest and conveyers, by which the flour and bran are mingled in any desired proportions, and passed together into the conveyer, so as to give complete control over the action and products and to prevent the choking or filling up of the meshes of the bolting cloth, substantially as described.

I claim, also, the manner in which I have combined the spout d with the bottom of I, and top of L and G with the bottom of L, and the burrs, so as to pass to the burrs, such portion of middlings as require re-grinding, as before described.

And while I do not claim as my invention the separate parts of my bolting machinery, taken individually, I do claim as new, and of my invention, the manner of combining and arranging those parts substantially as before described—so that entire control is given over the process of bolting, and it is made one entire and continuous action and by machinery, by which any desired portion of the flour in the first bolting chest is passed through i or i and j, into the packing chest; and any portion thereof passed through k or l, into L, and thence through f, with the flour from I through e, to the elevators, and any portion at the miller's discretion passed through b b, &c., into F.

And the flour unbolted from M, the flour from b b, &c., and the bran from O, mingled and passed together in any proportions through G, into I and H, and then thoroughly bolted and separated without any choking of the meshes of the bolt, the bran passed off through J, and the offal through h, in any required condition, the middling forced through d, into L, and from thence through g to the burrs to be re-ground, while the flour is forced through e into L, and meeting with the flour passed into L, from l, with it carried through f to the flour elevators.

[This is a most difficult claim to understand—it is not clearly defined in the separate parts: no one can tell what the letters mean.]

To Mary W. O'Meara, of New York, N. Y., for improvement in Abdominal Supporters.

I claim this abdominal supporter, constructed with the bodice, in combination with the trunk hose, in the manner described, or in any other manner substantially the same, for the purpose set forth.

To T. Slaight, of Newark, N. J., (Assignor to H. C. Jones), for improved method of operating lock-bolts.

What I claim is operating, by means of reciprocating slides a vibrating lever provided with a bolt at one end and projecting from the back face of the lock, substantially as described.

To Wm. T. Welch, Jr., of Churchville, Md., for improvement in brakes for carriages.

The combination and arrangement of the suspended toothed or notched bar, staple, spring hook rod, connecting rod, and plate, for actuating and locking the rubbers against the peripheries of the wheels, and unlocking the same in passing over plains, by the action of the horses, as described and represented.

To E. Williams & James Culbertson of Kenton Co., Ky., for machine for giving increased twist in cutting rifles.

What we claim is the jointing the guides (four) in combination with the chord piece for sustaining it in position or their equivalents, for the purpose of giving the guide as bent, when operated upon by the aforesaid lugs or screws or their equivalents, a rocking motion; making the point of attachment to the traversing bar or other similar contrivance, describe a curve, with reference to the bed which traverses beneath; thereby compelling the point of attachment to the traversing bar or its equivalent to recede in a gradually increasing ratio (accompanied by an equivalent increased velocity of the rotary head) from the axis of the mandrel for the purpose of producing an increasing or decreasing twist to the groove in the bore—after the manner substantially as herein described.

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TO CORRESPONDENTS.

"H. & C. C., of Pa."—It is not possible to give the quantities of the colors you write about—the shades are so different in one color. There is a book (cost $17,) a London work, containing all the patterns—and shades with the quantities for each shade and color. You should get it. The receipts will yet be published.

"T. M. D., of Pa."—We confess that we do not see how you would gain anything by the plan you propose. The pressure of the water, is taken with most advantage from great heights, with little water, but your case is the reverse. You want a quick action, and rapid discharge, which cannot be obtained so well by your pressure. But is there not something wrong—a leak, or something about the blower. We know no plan to equal the percussion wheel in your case—two on one shaft.

"H. P., of Mo."—Yours next week.

"G. S. B., of Me."—Your letter reached us safely. The publication referred to is full of blunders, some of which we have noticed in our columns. We shall be extremely obliged to you for such information as you propose to give, the subject is one of interest. If you can furnish rough drawings of such machinery as you use in the business we will have the necessary engravings made. Your testimonial in favor of the "Sci. Am." adds another to a large list.

"J. B. R. of Ala."—Your circulars were ready on Saturday the 2nd inst., but Mr. Turner was not to be found at the time we sent them to his lodgings, and as he did not call for them after leaving the order they were not sent by him. Please remit us the $5 and give directions how they are to be sent.

"L. S. S., of Me."—We should conclude that your hold back was new. You had better send a model and then we can advise you what to claim after we have more thoroughly examined it.

"H. B., of Wis."—We are much obliged to you indeed. From our knowledge of many difficulties in rotary engines, we would advise you not to spend money on it.

"J. R., of Ohio."—From Judge Grier's opinion page's 102, 107, Sci. Am., it appears to be an infringement,—but the patent in all likelihood will be repealed, if not now, at some other time.

"M. J. E., of N. Y."—We cannot tell how long it would take to get out a patent. The papers could be prepared here in a few days; a model must first be sent, as the drawings must be made from it. We could tell the cost upon receipt of the model.

"N. B., of Pa."—We cannot furnish you such an instrument as you want.

"S. A. P., of Conn."—Your statement is correct, but we cannot tell at what time the application will be acted upon, it must await its turn.

"C. S. M., of Ohio."—We coincide with your views in regard to a work upon woolen manufacturing and dyeing, and we should be glad to learn that some one competent to the task would undertake it.

"E. W. D., of Mass."—We do not think our Boston agents have bound volumes on hand, they can, however, supply you through us. 3,300 lbs., passes through a space of 1 foot per minute,—one horse power you can easily calculate from this.

"J. R. L., of Ohio."—The engine plate referred to cannot be sent by mail. We do not know whether the "Anglo Saxon" is now published or not, have not seen it recently.

"T. F., of Mass."—Machines are now in use for rolling out iron and steel. We cannot say whether your plan is new or not, you had better send a well described drawing or a model.

"B. F. C., of C. L. S., Pa."—The condensing Engine Plate cannot be sent by mail.—We shall await your order. $2 has been placed to your credit for one year's subscription.

"A. A. C., of Ct."—You had better constuct a model of your apparatus, as we can from no idea of it from your description.

"A. F. G., of Geo."—We will retain the numbers of Duggan's work, subject to your order.

"C. F. T., of Ky."—We cannot find T Law's work; Messrs. Appletons have not got it.

"A. J., of N. Y."—We have none of the articles on hand refered to in your letter, therefore we cannot send them.

"A. W. D., of Me."—What do you wish done with the model which accompanied your communication? The letter has been filed for attention.

"T. W., of Tenn."—We find your statement correct, and have straightened the matter accordingly.

"M. O'C., of Conn."—We are unable to answer your inquiry fully; although we are of the opinion that the Staten Island Dyeing and Bleaching concern could accomodate you—their office is in John st., this city.

"M L. W., of N. Y."—We cannot furnish your Vol. 1 nor the number in Vol. 2 that you want.

"D. L., of Ill."—Your invention appears new to us, but we are of the opinion that it would not be the source of much profit. We presume you are of this opinion. It may be that we shall publish the bridge referred to, before long. Your criticism is correct, but the article found its way into our columns by some means.

"J. W. & Co., of Ohio."—Nos. 1 and 36 of Vol. 4 cannot be supplied from this office. We wrote you giving information in regard to nail keg machinery a few days since.

"B. F., of Va."—We regard your ideas as entirely impractible, and our advice would be that you spend no money upon it. The worm is undoubtly the best, as you get a greater amount of cooling surface form it. The numbers you ordered have been sent.

"A. R., of N. Y.—We have examined into your case carefully and do not think that in either case a patent could be obtained, a mere change in form could not be patented. We advise that you go no farther towards securing it. Back Nos. sent.

"J. R. B., of Ky."—Your ideas are new to us, but we think you will find much trouble in accomplishing what you propose. We should not wish to express an opinion fully until we know more about the matter. Try an experiment and satisfy yourself. $3 received.

"G. T., of Pa.—Your plan has been examined and found to possess no novelty. The same plan has been shown us several times, and could not be patented. Mr. Ewbank the present Commission of Patents, experimented with a similar plan, but we think not with satisfacfaction to himself.

"A. K. C., of N. J."—We have received yours. It was our intention to give an article on the "Rights of Assignees" next week, and this we will do.

"M. N., of Pa."—We do not clearly understand your enquiry. There is no claim, however, to the turning of the re-action wheel in any direction.

"J. H. O., of Wis."—We will publish next week the full description of Wall's process of applying electricity to the manufacture of iron, also some other information about the phosphorus in the iron.

"J. H. S., of Canada."—Having carefully examined your invention, it appears new to us, patentable, and very useful. The patent fee for a subject of Great Britain is $500.

"T C., of Va."—We think the magazine still continues to be published. It can be had of Geo Putnam of this city. $4 received.

Money received on account of Patent Office business, since March 12, 1850:—

E. H., of Mass., $20. U. W., of N. Y., $5. O. C., of Ill., $33. G. C. G., of O., $35. A. B. W., of Mass., $20. N. T. W., of Me., $30. C. H. T., of N. J., & F. H. D., of N. H., $50.

NOTE—Several boxes (presumed to contain models) remain at the various Express Offices in this city, marked to our address, but upon which the expense of transportation has not been paid. It has become a severe tax upon us to pay the expenses on models sent for examination, and in future none will be received upon which the express fees are unpaid, except from such sections of the country as seem apparent to us that the expenses *could not* have been settled at the time of transmitting it.

Back Volumes Scientific American.

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Tanning--Practical Remarks.

(Continued from page 208.)

Bark, at the present day, is ground without shaving, in a cast iron mill, into small grains, the finer the better, and is carried by elevators and cloths, moved by gearing from the bark mill shaft, into lofts erected over the leeches, and so arranged as to be left wherever it is wanted.

Leeches are made of plank, 25 to 30 feet long, 6 to 10 feet wide, 6 to 9 feet deep, firmly gripped with square timber, and ranged in setts of two, one above the other, side by side, any required number; usually, the bottom leech encroaches upon the bed of the stream upon which the tannery is built. The water which moves the machinery of the tannery is taken from the mill pond in a tight square trunk, through the length of the building on the stream side.

The leeches are placed along side of and endwise to this trunk, the bottom one coming up to the level of the trunk. In each top leech is fixed a copper heater of corresponding length, with a barrel 2 to 3 feet in diameter per 6 feet, and a pipe 10 to 15 inches, curving at the far end, and extending above the surface, thence a sheet iron pipe of the same size conducts the smoke into a chimney, or which is safer, into an iron condensing pipe 20 inches in diameter, with a bonnet at each end placed horizontally in the rear, at some elevation, and out of harm's way. Sparks are caught in this pipe; they cannot escape with the current of smoke, and the greatest risk of fire is effectually overcome. The mouth of the heaters open upon the trunk, which forms a convenient alley to pass fuel along the line, and are secured by a sheet iron door, on hinges with a latch, and an opening for draft at the bottom. The leeches are fitted up with false bottoms, to retain the bark when the liquor is drawn off with plugs, to be used at pleasure. The bark left is built over or upon the leeches leaving a few feet of the latter at the stream end, open to the weather, to make room for the heater pipe, as before stated, and avoiding contact with any combustible matter.

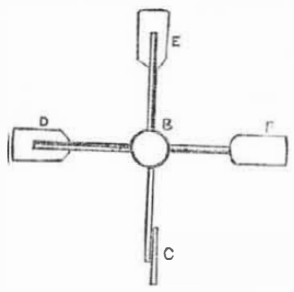
The ground bark is let down from the loft into the leeches, until they are two-thirds full, when clean water or liquor partially spent, is pumped on to the top leech, till nearly full. A fire of dry wood is built in the heater, and continued until the mass rises to boiling heat, when the fire is withdrawn, and the liquor is let down on to bark on the bottom leech, where it remains twelve hours, when it is run through a line of logs underneath the range, into a junk or deep vat, conveniently placed in the yard, and is pumped up into receivers, or single leeches, above ground, which are placed on the front side of the tannery, where it is suffered to cool, to temperate heat or more, when it is drawn off through another line of logs, and distributed through the yard from heads, and shutes, or by plugs at each vat as (by the construction of the yard) it is wanted. This is the first run, and should be 20° strength by the barkometer. The same process is repeated daily, until six runs have been taken off, each reduced in strength down to 3 or 5°, when the mass is rinsed with a run of water without heat, which is afterwards pumped on to a newer leech. The spent bark is now cast and received between the tiers of leeches into a shute of one or two feet wide, through which a stream of water runs from the trunk, which carries the bark out of the way into the stream. A trough of water is also kept running along the top of the trunk, and in front of the heaters, into which the coals are cast and extinguished, when the fire is drawn out of the heaters—to run off the liquor before described. This is necessary, because the fire melts the heaters the moment the liquor is withdrawn if left burning—a job sometimes done to the great risk of the property, delay, and derangement of the business. Six tiers of leeches are the most convenient for all large tanneries, filling up the work with a round, and these sizes should be made to give a supply equal to the wants of the stock intended to be tanned. In our next we shall show the manner of using the liquor.

History of Propellers and Steam Navigation.

[Continued from page 208.]

This propeller is the invention of the celebrated Jacob Perkins. Each of the paddles is placed on the extremity of a radiating arm, in such a position that its plane, if produced towards the centre of motion, would make with the axis of the paddle-wheel an angle of 45 degrees. The axes of the paddle-wheels are not carried across the vessel in the customary manner, but are carried in a direction slooping towards the stern, and they meet at a point in a straight line, drawn from stem to stern along the middle of the vessel, making with it an angle of 45 degrees, and with each other an angle of 90 degrees. On the extremities of the axis are fixed bevel-wheels, which act upon each other, or are both acted upon by an intermediate bevel-wheel in connexion with the steam engine, or first mover.

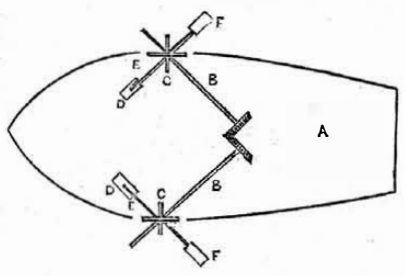
Fig. 28.



By this arrangement the surface of each paddle, when immersed in the water at its greatest depth, is perpendicular to the side of the vessel, or to the line of motion, as represented at C, fig. 1, in the annexed cut; at their greatest elevation, each paddle is parellel to the line of motion, as at E; and, when in the horzontal position, whether ascending or descending, the paddles present an angle of 45 degrees; and from this angle it deviates but little, when in the act of entering or leaving the water, as the patentee purposed to immerse the wheel to about one-fourth of its diameter.

Fig. 2, represents the outline (in plan) of a vessel with these paddles attached. A is the boat; B B the paddle axles, to which a uniform motion is given by the engine, through the medium of the bevel gear which connects them; C C are two of the paddles immersed in the water, and in the act of propelling; D D, E E, and F F, are those paddles which succeed each other in the revolution. The oblique action of the blades of the paddles, as they perform their revolutions, will be understood by reference to fig. 1, before explained, wherein the paddles are marked by the same letters as in fig. 2, to which therefore, the observations already made will apply.

Fig. 29.



This was invented in 1829, and some experiments made with them were reported in the Journal of the Franklin Institute, with the the following very flattering remarks, in comparison with the old paddles, "The saving of fuel appears to be upwards of three in five, and an increase of 15 per cent. of speed."—The article was furnished for the Journal, Vol. 9, by a gentleman in London, and is an inflated piece of commendation on Mr. Perkin's invention—and deals in some severe remarks on the inferiority of the old paddles. Although it was stated how superior this method of propelling was to the paddle wheels, yet it had its day only on paper—it came and is gone.

The White Wax Insect.

This insect is a native of China. The celebrated Geo. Stanton speaks of it as not much exceeding the size of a fly, having very curious pectinated appendages, rising in a curve, and bending towards the head; the whole insect being covered with a white powder. This powdery substance is imparted to the stems of the plants, upon which these insects are found in thick clusters. It is then collected by the natives; hot vegetable oil is then applied, and the whole, when cold, coagulates and becomes as firm as bees wax.

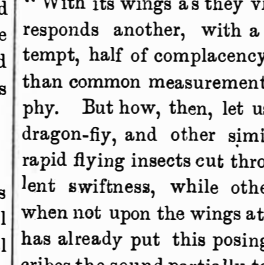
Cashmere Shawls.

The secret of the quality of these shawls is not in the working; it is in the beautiful wool from the goats of the Upper Thibet, the equal of which in softness has never yet been found. The goats live in high table-lands of Tartary, where the cold is intense, and to protect them from the piercing blast of winter they have the under-hair, or "Poshai," of this deliciously soft and wram meterial. This wool is brought down to Cashmere once every year by merchants, and sold to the shawl-makers. After thorough cleaning, it is dyed of varions colors; the dyers possess the vegetable or mineral ingredients for all the colours except green, and this they procure from English green baize by boiling. This is a very curious circumstance, not only because the colour thus obtained is a most beautiful and enduring one, but because it is so much prized by Mahommedans, being their holy colour, to be worn only by decendants of the Prophet, or those who have made the pilgrimage to Mecca. The shawl patterns are drawn upon paper, very minute, and with the greatest possible accuracy; fifty rupees are sometimes paid for the mere drawing of a very elaborate pattern. The dealers in shawls are the agents of merchants residing at Bombay, Delhi, Lahore, or other large cities, and having branch establishments throughout Asia.—These dealers give the order, and advance the money to the shawl manufacturers. It is impossible to buy a shawl direct from the manufacturer; he makes only to order from the dealer or middleman, and is entirely dependent upon him. The loom is that of the common kind, the buildings in which the men work low, confined, and ill ventilated. Each man (for no women work at the loom) sits with his little bundle of coloured wools wound upon small spindles, and a written paper before him, by which he is entirely guided as to the number of threads, &c., to take up. Each man works distinct from his neighbour, on his own loom; and as all shawls are made up of small pieces, each piece being about eight inches long, by four wide, the qualities of every workman can easly be detected. The most skilful earn about eight anas (equal to 25 cents) per day; this sum is, however, equivalent to a much larger amount, if reckoned at what it will procure. These small pieces, when finished, are made over to the agent or dealer, who has them sown together in a coarse manner, to judge of the general effect—they are afterwards washed in particular places in a stream branching from the river, and the water is said to possess pecular properties in softening the wool, and bringing out the brilliancy of the colours not found in any other spot. But few people visit Cashmere for the purpose of purchasing shawls; the distance is great, and the difficulties of the road deter all but the very adventurous; the agents, therefore despatch the shawls, after they have been washed, to the larger marts in Asia, and from their correspondents the local merchants purchase them. Besides the shawl, there are several varieties of dress made from the wool—one the Ahlwan, perfectly plain, of a dirty-white drab, and lilac colours; the texture seems dilightfully soft, but the large price asked for a piece five or six yards in length seemed far above the value. The shawl manufacture above described is that of the genuine and much prized kind; an inferior sort called the "zozuni," or sewn, is that in which there is a plain groundwork of wool, the Alhwan dyed of any colour, upon which the shawl pattern is worked with the needle. Many of these are very beautiful in appearance, and of most elegant patterns, but to the eye of the connoisseur they are almost destitute of value. The "fumawali" is a striped shawl material, wove in the piece, and used for dressing gowns, ladies' dresses, or for the alkaluk worn by the nobles of Lucknow, in the cold weather.

How Does a Fly Buz?

How does a fly buz? is a question more easily asked than answered. "With its wings, to be sure," hastily replies one of our readers.—"With its wings as they vibrate upon the air," responds another, with a smile, half of contempt, half of complacency of his own or more than common measurement of natural philosophy. But how, then, let us ask, can the great dragon-fly, and other similar broad-pinioned, rapid flying insects cut through the air with silent swiftness, while others go on buzzing when not upon the wings at all? Rennie, who has already put this posing query, himself ascribes the sound partially to air, but to air as it plays on the edges of their wings at their origin as with an Æolian harp string," or to the friction of some internal organ at the root of the nerves. Lastly, how does the fly feed? the busy, curious, thirsty fly that "drinks with me," but does not "drink as I," his sole instrument for eating or drinking being his trunk or suck; the narrow pipe, by means of which, when let down upon his dainties, he is enabled to imbibe as much as suits his capacity. This trunk might seem an instrument convenient enough when inserted into a saucer of syrup, or applied to the broken surface of an over-ripe blackberry, but we often see our sipper of sweets quite as busy on a solid lump of sugar, which we shall find, on close inspection, growing "small by degrees" under his attack.—How without grinders, does he accomplish the consumption of such crystal condiment? A magnifier will solve the difficulty, and show how the fly dissolves his rock. Hannibal fashion, by a dilutent, salivery fluid passing down the same pipe, which returns the sugar melted into syrup.

Improvement in English Woollen Goods.—In consequence of the decline of the English wollen trade for the last few years, attributed to the superior color and finish of the fabrics, of Belgium and France, a superiority that has been sensibly appreciated by the importers in this country; various efforts have been made in England to bring its cloths up to the continental standard. A process has therefore been invented called the Steriolaic. The wool is better picked and washed. Indigo is used for the foundation of the dye, instead of logwood and the finish is effected by a machine of superior character to the Belgian. The cloth thus produced, is said never to lose its glossiness, the "feel" is soft, and if wet, loses nothing of its lustre.



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